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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,735	10/10/2006	Christoph Carlhoff	DN 02-019	4495

7590 07/24/2009
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EXAMINER

ZHENG, LOIS L

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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07/24/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/576,735	Applicant(s) CARLHOFF ET AL.	
	Examiner LOIS ZHENG	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/11/06, 1/12/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of invention group I, claims 1-6 in the reply filed on 20 April 2009 is acknowledged.
2. Claims 7-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention group II, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 20 April 2009.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 62-228423(JP'423).

JP'423 teaches a process of taking measurement from a steel refining furnace, comprising passing a tuyere(Fig. 1 #1) through a metallurgical vessel(Fig. 1 #2), intermittently blowing oxygen gas(Figs. 1-2) into the vessel through the tuyere, measuring the temperature inside the metallurgical vessel via a two-color pyrometer(i.e. dual-wavelength pyrometer)(Fig. 1 #4), and monitoring internal condition of the metallurgical vessel via a video camera(Fig. 1 #5). JP'423 further teaches that the data

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collected from these measurement devices improves the accuracy of oxygen gas blowing (abstract).

Regarding claim 1, since the intensity and the ratio of the pyrometer signals are parameters provided by the pyrometer reflecting temperature conditions of the metallurgical vessel, and JP'423 teaches that the measurements from pyrometer improves oxygen blowing accuracy, one of ordinary skill in the art would have found it obvious to have analyzed the intensity and the ratio signals of the two-color pyrometer of JP'423 to determine proper interval for blowing in the process of JP'423.

Regarding claim 2, JP'423 teaches utilizing a video camera arranged with the pyrometer along one optical path. Since video camera and signals from pyrometer are used in combination to improve blowing accuracy in the process of JP'423, it would have been within one of ordinary skill in the art to have noticed clogging in the tuyere and determined appropriate times for removing the clogging based on the images from the video camera and the intensity and ratio signals from pyrometer.

Regarding claim 4, JP'423 teaches the claimed pyrometer.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 62-228423 (JP'423), and further in view of Craig et al. US 5,963,311 (Craig).

The teachings of JP'423 are discussed in paragraph 4 above. However, JP'423 does not explicitly teach the claimed measuring unit capable of varying the orientation of the optical path.

Craig et al. US 5,963,311 teaches an apparatus, used for visualizing hot objects, comprises a dual path pyrometer, an auto-focus video camera and means for varying

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the orientation of the optical path(abstract, col. 3 lines 27-29, 61-67, col. 4 lines 44-47, col. 5 line 22 – col. 6 line 10).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the adjustment means for varying the orientation of the optical path as taught by Craig into the tuyere of JP'423 in order to provide additional images.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 62-228423(JP'423), and further in view of Cates US 5,830,407(Cates).

The teachings of JP'423 are discussed in paragraph 4 above. However, JP'423 does not explicitly teach the claimed spectrometer.

Cates teaches that optical sensors such as a pyrometer, spectrometer or a camera can be used to view and analyze the molten metal inside the furnace(col. 2 lines 51-54).

Therefore, it would have been obvious to one of ordinary skill in the art to have substituted the pyrometer as taught by JP'423 with a spectrometer as taught by Cates with expectation of success since Cates teaches that a pyrometer and a spectrometer are functionally equivalent.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP2001-141376(JP'376), and in view of JP 62-228423(JP'423).

JP'376 teaches that the length of a tuyere passing through a refining furnace may be determined by images captured by a CCD camera(abstract). JP'376 further teaches that the camera is provided at the top end of the tuyere and an image of the

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lower end opening of the tuyere may be picked up by the camera(i.e. focus is on the lower end opening of the tuyere)(abstract, Fig. 1).

However, JP'376 does not explicitly teach claimed video camera.

The teachings of JP'423 are discussed in paragraph 4 above. Therefore, the video camera of JP'423 and the CCD camera of JP'376 are functionally equivalent equipments capable of capturing images of the internals of a refining furnace.

Therefore, one of ordinary skill in the art would have found it obvious to substitute the CCD camera as taught by JP'376 with the video camera of JP'423 with expectation of successfully capturing images at lower end opening of a tuyere.

Furthermore, one of ordinary skill in the art would have found it obvious to have incorporated an auto-focus feature in the video camera of JP'376 in view of JP'423 in order to allow automatic focus of visual images.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LOIS ZHENG whose telephone number is (571)272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

LLZ